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METEOROLOGICAL OBSERVATIONS TAKEN ON THE NILE
BETWEEN CAIRO AND THE FIRST CATARACT, DURING
JANUARY AND FEBRUARY, 1873.

BY LIEUT.-COL. R. S. WILLIAMSON,

UNITED STATES CORPS OF ENGINEERS.

(Read before the American Philosophical Society, September 17, 1875.)

SAN FRANCISCO, CAL., July 26, 1875.

To the Secretary of the American Philosophical Society :

DEAR SIR :

I send you two sheets of Meteorological Observations which I made during January and February, 1873, on the Nile, thinking that they might be considered of sufficient interest to find a place among the printed Proceedings of the American Philosophical Society.

While the general character of the climate of that country is well known, I have not heard of there having been published any regular series of observations of the wet bulb from there ; and the large number of tourists who annually visit that river, the majority of whom are Americans, makes facts concerning it of more than usual interest.

I had had made in Cairo, before starting up the river, a box two feet square, four sides of which were of lattice blinds, so that the instruments, when suspended in it, were perfectly protected from the direct rays of the sun, while the wind passed freely through it. One side of the box was provided with double doors, one or both of which could be opened or closed at pleasure. The box was placed on a table on the upper deck of the boat, and securely fastened to it. The bulbs were about ten feet from the water. Usually there was an awning above. From frequent experiments I found that there was no difference between the readings of the instruments when the doors of the box were open or closed.

The principal instruments were two sensitive identical Thermometers, which read alike when the bulbs were dry. They were made by James Green, of New York, and were of the best construction. There was also a minimum Thermometer, but not of so nice a construction.

The reductions were made by means of the tables in Profession Papers of the Corps of Engineers, No. 15, a copy of which is in the library of the Society.

The boat went up the river as far as Assouan, at the foot of the first Cataract, and six degrees of latitude south from Cairo, and returned.

Yours very truly,

R. S. WILLIAMSON,

Lieut.-Col. United States Engineers.

METEOROLOGICAL OBSERVATIONS TAKEN ON THE NILE BETWEEN CAIRO AND THE FIRST Cataract

BY LIEUT.-COL. R. S. WILLIAMSON, U. S. Corps of Engineers

Date.	Locality.	Latitude.	Dry Bulb.			Wet Bulb.			Difference.			Force of Vapor.			Rel'tve Humidity.			Dew F.		
			7 A.M.	2 P.M.	9 P.M.	Mean	7 A.M.	2 P.M.	9 P.M.	7 A.M.	2 P.M.	9 P.M.	7 A.M.	2 P.M.	9 P.M.	7 A.M.	2 P.M.	9 P.M.	7 A.M.	2 P.M.
Jan'y. 1	Cairo,	30°00'	45.	63.	50.	52.7	44.	51.	46.	1.	12.	4.	0.276	0.256	0.265	92.2	44.4	73.4	42.8	40
" 2	Benisooef,	29°10'	43.5	65.5	58.	55.7	41.	49.5	46.5	2.5	16.	11.5	.229	.215	.213	88.1	34.4	44.1	38.0	36
" 3		28°10'	38.	69.	56.	54.3	35.5	55.5	49.5	2.5	13.5	6.5	.182	.299	.282	79.3	42.3	62.8	32.1	44
" 4			34.	69.	51.5	51.5	33.	55.	47.5	1.	14.	4.	.176	.289	.282	89.6	40.8	72.8	31.2	44
" 5	Rhoda,	45.5	70.	54.5	56.7	41.5	55.	50.	4.	15.	4.5	.220	.283	.307	72.0	38.6	72.2	36.9	43	
" 6	Mellawee,	47.	67.	52.	55.3	46.	54.	47.	1.	13.	5.	.298	.284	.266	92.4	42.8	68.6	44.9	43	
" 7	Manialoot,	27°45'	41.5	66.5	51.5	53.2	38.5	53.	47.	3.	13.5	4.5	.202	.269	.271	77.0	41.3	71.1	34.7	42
" 8		27°20'	40.5	65.5	51.	52.3	40.	55.5	47.5	0.5	10.	3.5	.242	.287	.281	95.9	51.9	76.6	39.3	47
" 9	Sloot,	27°10'	40.	66.	54.	53.3	39.5	56.	49.5	0.5	10.	4.5	.237	.334	.301	95.9	52.1	72.0	38.8	47
" 10			44.5	64.5	51.	53.3	42.5	62.5	47.	2.	12.	4.	.249	.273	.276	84.8	45.0	73.7	40.1	42
" 11	Girgeh,	26°20'	44.	64.5	52.	53.5	40.5	52.	45.	3.5	12.5	7.	.215	.263	.228	74.7	43.5	78.7	36.4	41
" 12			41.	65.	53.	53.	38.5	53.5	46.	2.5	11.5	7.	.206	.288	.238	80.4	46.6	59.2	35.3	44
" 13			44.5	69.5	56.5	56.8	43.5	57.5	49.5	1.	12.	7.	.270	.338	.278	92.0	48.4	68.6	40.2	43
" 14	Keneh,	26°10'	46.5	64.	56.	55.5	45.	51.	46.5	1.5	13.	9.5	.281	.249	.225	88.7	41.8	50.2	43.3	40
" 15	Negadeh,	25°55'	49.	70.	54.	57.7	45.	55.	47.5	4.	15.	6.5	.254	.283	.258	73.0	38.6	62.0	40.7	42
" 16	Thebes,	25°45'	43.	70.	51.	54.6	39.5	55.	45.	3.5	16.	6.	.206	.283	.236	74.4	38.6	63.1	35.3	43
" 17	Erment,	25°40'	42.	75.	57.	58.	40.	60.	47.5	2.	18.	9.5	.225	.351	.236	84.3	40.5	50.7	37.5	49
" 18	Edfoo,	25°00'	46.	72.	59.5	59.2	44.	58.	49.0	2.	14.	10.5	.264	.330	.244	85.1	42.0	48.1	41.7	47
" 19	Kom Ombos,	24°35'	50.	72.	61.	61.	47.5	54.	50.	2.5	18.	11.	.298	.258	.252	82.5	32.2	47.0	44.8	40
" 20	Assouan,	24°00'	49.	71.	62.	60.7	46.	56.	55.5	3.	15.	6.5	.275	.296	.360	79.1	39.1	64.8	42.8	44
" 21			52.5	74.	63.	63.2	50.5	57.	50.	2.	17.	13.	.341	.295	.288	86.3	35.3	41.4	48.5	44
" 22			50.	74.	68.	64.	45.	59.	54.5	5.	15.	13.5	.245	.336	.286	67.8	40.1	41.8	39.7	48
" 23			53.5	75.5	67.	66.3	48.5	58.5	54.	5.	17.	13.	.284	.315	.284	69.1	35.7	42.8	45.5	46
" 24			56.	75.	65.	63.3	49.5	58.	56.	6.5	17.	10.	.282	.308	.320	62.8	35.6	51.7	43.4	45
" 25	Kom Ombos,	24°85'	41.5	76.	63.5	60.3	39.5	58.5	56.	2.	17.5	7.5	.220	.310	.357	84.1	34.8	61.0	37.0	46
" 26	Edfoo,	25°00'	53.5	79.5	59.5	64.2	49.5	59.	50.5	4.	20.5	9.	.306	.299	.272	74.5	29.7	53.5	45.5	45
" 27			52.5	77.	57.	62.2	48.5	57.5	49.	4.	19.5	8.	.294	.286	.264	74.2	30.9	56.6	44.5	43
" 28	Esné,	25°20'	55.	71.	60.5	62.2	49.	56.	48.	6.	15.	12.	.281	.296	.221	64.7	39.1	41.9	43.2	44
" 29			47.	72.	58	59.2	43.5	57.	49.5	3.5	15.	9.	.244	.309	.261	75.7	39.4	53.2	39.6	45
" 30			44.5	77.	58	60.	40.5	56.	47.	4.	21.	11.5	.210	.260	.218	71.6	28.0	44.4	35.8	41
" 31			56.	72.	61.5	63.2	48.	57.5	53.5	8.	14.5	8.	.252	.319	.318	55.2	40.6	58.1	40.5	46
Mean			46.3	70.4	57.2	58.0	43.3	55.6	49.2	3.0	14.8	8.0	0.230	0.293	0.269	79.6	39.8	58.0	40.0	44
Feby 1	Erment,	25°40'	52.	78.	60.5	62.8	48.5	61.	55.	3.5	15.	5.5	.299	.366	.363	77.0	40.8	68.9	44.9	50
" 2			58.	73.	63.5	64.8	54.5	60.5	57.5	3.5	12.5	6.	.379	.378	.395	78.6	46.6	67.4	51.3	51
" 3			58.5	73.	58.	62.2	51.	57.	49.	7.5	16.	9.	.291	.302	.256	59.3	37.3	53.0	44.3	45
" 4			48.5	71.	61.	60.2	46.	56.5	54.	2.5	14.5	7.	.280	.305	.334	82.2	40.3	62.2	43.3	45
" 5			50.5	72.	65.	62.5	49.5	59.	53.5	1.0	13.	11.5	.341	.352	.288	92.7	44.8	46.6	48.4	49
" 6			48.5	76.	66.5	63.7	45.	62.	55.5	3.5	14.	11.	.259	.389	.317	75.9	43.4	48.9	41.2	52
" 7	Thebes,	25°45'	60.5	73.	63.	65.5	51.5	57.	51.5	9.0	16.	11.5	.284	.302	.265	53.9	37.3	46.0	43.6	45
" 8			50.	77.5	60.	62.5	45.	59.	51.5	5.	18.5	8.5	.245	.311	.288	67.8	33.1	55.7	39.7	48
" 9	Keneh,	26°10'	52.5	73.5	57.5	61.2	49.	57.5	51.	3.5	16.	6.5	.305	.308	.300	76.6	37.4	63.4	45.4	45
" 10			49.5	78.	62.	63.2	45.	58.	56.	4.5	20.	6.	.249	.289	.372	70.4	30.2	67.1	40.2	44
" 11			50.	79.	60.	63.0	47.5	61.	54.	2.5	18.	6.	.298	.343	.344	82.6	34.6	66.4	44.8	48
" 12	Bellianeh,	26°10'	52.5	76.	58.5	62.3	46.	58.	51.5	6.5	18.	7.5	.242	.302	.302	61.2	33.7	61.4	39.4	45
" 13			52.5	84.	66.	67.5	49.5	63.	60.5	3.	21.	5.5	.317	.350	.449	80.0	30.0	40.4	46.4	49
" 14	Eckmine,	26°30'	62.5	92.	75.	78.5	57.5	67.	57.	5.	25.	18.	.406	.383	.289	78.1	25.5	33.4	53.2	51
" 15	Souhag,	26°30'	72.	77.	62.5	70.5	61.	60.5	54.5	11.	16.5	8.	.400	.346	.331	50.9	37.4	54.5	52.7	49
" 16			55.	64.5	53.	57.5	49.5	51.5	45.5	5.5	13.	7.5	.291	.254	.229	67.2	42.0	56.9	44.2	40
" 17			48.	65.	56.5	58.5	42.	52.	51.	6.	13.	5.5	.207	.260	.310	61.8	42.2	67.8	35.4	41
" 18	Siout,	27°10'	43.	63.5	49.	51.8	39.	50.	43.	4.	13.5	6.	.197	.235	.216	71.1	40.1	62.2	34.2	38
" 19			41.	59.	50.5	50.2	39.5	47.	44.5	1.5	12.	5.5	.226	.215	.231	87.9	42.9	62.8	37.6	36
" 20			49.	60.	54.	54.3	44.5	48.5	46.5	4.5	11.5	7.5	.244	.232	.239	70.2	44.9	57.4	39.6	38
" 21			49.5	64.	51.	53.2	44.	52.	45.	0.5	12.	6.	.282	.267	.236	96.1	44.8	63.1	43.4	42
" 22	Beni-Hassen,	28°00'	45.	67.	60.	57.3	44.	56.	52.5	1.	11.	7.5	.276	.325	.309	70.2	49.1	59.8	42.8	47
" 23			51.	69.5	58.	69.5	49.5	57.	52.	1.5	12.5	6.	.334	.327	.318	89.4	45.2	65.3	47.9	47
" 24			49.5	70.	59.	59.5	47.5	56.5	52.	2.	13.5	6.	.304	.308	.307	85.7	42.6	61.6	45.3	46
" 25			48.	68.5	59.	58.	46.	56.5	54.5	2.	12.	4.5	.286	.324	.367	85.3	46.5	73.5	43.8	47
" 26	Neghoda,	29°00'	51.5	72.	53.5	59.0	50.5	56.5	48.5	1.	15.5	5.	.354	.299	.284	92.8	38.2	69.1	49.5	44
" 27	Benisooef,	29°10'	47.5	69.5	58.	58.3	46.5	56.5	53.	1.	13.	5.	.304	.316	.341	92.3	43.9	70.7	45.4	46
" 28	Sakbara, (Near Memphis.)	29°45'	53.5	74.5	58.	62.0	52.	58.	52.	1.5	16.5	6.	.367	.311	.318	89.8	36.6	65.8	50.5	46
Mean			51.6	72.1	59.2	61.0	47.9	57.0	51.9	3.7	15.1	7.4	0.295	0.311	0.307	77.2	39.7	60.9	44.2	45

ON THE NILE BETWEEN CAIRO AND THE FIRST CATARACT, DURING JANUARY, 1873.

LIEUT.-COL. R. S. WILLIAMSON, U. S. Corps of Engineers.

A.M.	Difference.			Force of Vapor.			Rel'tve Humidity.			Dew Point.			Clouds.			Winds.			Remarks.	
	7 A.M.	2 P.M.	9 P.M.	7 A.M.	2 P.M.	9 P.M.	7 A.M.	2 P.M.	9 P.M.	7 A.M.	2 P.M.	9 P.M.	7 A.M.	2 P.M.	9 P.M.	7 A.M.	2 P.M.	9 P.M.		
46.	1.	12.	4.	0.276	0.256	0.265	92.2	44.4	73.4	42.8	40.8	41.8	Clear.	Cir. 3.	Clear.	N. 2.	N. 4.	N. 2.	Min. 40.5. Dew. 36.5.	
46.5	2.5	16.	11.5	.229	.215	.213	88.1	34.4	44.1	38.0	36.5	36.1	“	Clear.	“	“ 1.	“ 4.	0.	0.	
49.5	2.5	13.5	6.5	.182	.299	.282	79.3	42.3	62.8	32.1	44.9	42.4	“	Cir. cu. 4.	“	“ 1.	0.	0.		
47.5	1.	14.	4.	.176	.289	.282	89.6	40.8	72.8	31.2	44.1	43.3	“	Clear.	“	S. 1.	S. 1.	0.		
50.	4.	15.	4.5	.220	.283	.307	72.0	38.6	72.2	36.9	43.5	45.7	“	“	“	S. 0.	N. 2.	0.		
47.	1.	13.	5.	.298	.284	.266	92.4	42.8	68.6	44.9	43.6	41.9	“	Cu. st. 9.	Cir. cu. 7.	0.	N. 3.	0.		
47.	3.	13.5	4.5	.202	.269	.271	77.0	41.3	71.1	34.7	42.2	42.3	“	Clear.	Clear.	0.	N. 3.	0.		
47.5	0.5	10.	3.5	.242	.327	.287	95.9	51.9	76.6	39.3	47.3	43.8	“	Cir. 2.	“	0.	N. 3.	0.		
49.5	0.5	10.	4.5	.237	.334	.301	95.9	52.1	72.0	38.8	47.9	45.1	“	Clear.	“	N. 2.	N. 5.			
47.	2.	12.	4.	.249	.273	.276	84.8	45.0	73.7	40.1	42.6	42.8	“	“	“	N. 4.	N. 2.			
45.	3.5	12.5	7.	.215	.263	.228	74.7	43.5	78.7	36.4	41.6	37.9	“	“	“	N. 2.	N. 1.			
46.	2.5	11.5	7.	.206	.288	.238	80.4	46.6	59.2	35.3	44.0	39.0	“	Cu. 1.	“	N. 3.	N. 2.			
49.5	1.	12.	7.	.270	.338	.278	92.0	46.8	60.7	42.3	48.2	43.0	“	Cir. cu. 2.	“	N. 2.	N. 1.			
46.5	1.5	13.	9.5	.281	.249	.225	88.7	41.8	50.2	43.3	40.2	37.6	“	Clear.	“	N. 3.	N. 2.			
47.5	4.	15.	6.5	.254	.283	.258	73.0	38.6	62.0	40.7	42.5	41.1	“	“	“	N. 1.	N. 1.			
45.	3.5	15.	6.	.206	.283	.236	74.4	38.6	63.1	35.3	43.5	38.8	“	“	“	N. 1.	N. 1.			
47.5	2.	15.	9.5	.225	.351	.326	84.3	40.5	50.7	37.5	49.2	38.7	“	“	“	N. 2.	N. 1.			
49.0	2.	14.	10.5	.264	.330	.244	85.1	42.0	48.1	41.7	47.5	39.7	“	“	“	N. 1.	N. 1.			
50.	2.5	18.	11.	.298	.253	.252	82.5	32.2	47.0	44.8	40.5	40.4	“	“	“	N. 4.				
55.5	3.	15.	6.5	.275	.296	.360	79.1	39.1	64.8	42.8	44.6	49.9	“	“	“					
50.	2.	17.	13.	.341	.295	.238	86.3	35.3	41.4	48.5	44.6	39.0	“	“	“	N. 1.	N. 1.			
54.5	5.	15.	13.5	.245	.336	.286	67.8	40.1	41.8	39.7	48.1	43.8	“	“	“					
54.	5.	17.	13.	.284	.315	.284	69.1	35.7	42.8	43.5	46.3	42.6	“	Cir. 3.	“	N. 1.				
55.	6.5	17.	10.	.282	.308	.320	62.8	35.6	51.7	43.4	45.8	46.8	“	Clear.	“					
56.	2.	17.5	7.5	.220	.310	.357	84.1	34.8	61.0	37.0	46.1	49.8	“	“	“	N. 1.				
50.5	4.	20.5	9.	.306	.299	.272	74.5	29.7	53.5	45.5	45.0	42.5	“	“	“	N. 2.				
49.	4.	19.5	8.	.294	.286	.264	74.2	30.9	56.6	44.5	43.8	41.6	“	“	“	N. 1.	N. 1.			
48.	6.	15.	12.5	.281	.296	.221	64.7	39.1	41.9	43.2	44.6	37.0	“	“	“	S. 1.	N. 3.			
49.5	3.5	15.	9.	.244	.309	.261	75.7	39.4	53.2	39.6	45.8	41.4	“	Cir. 7.	“					
47.	4.	21.	11.5	.210	.260	.218	71.6	28.0	44.4	35.8	41.3	36.7	Cu. 5.	Clear.	“	N. 1.				
53.5	8.	14.5	8.	.252	.319	.318	56.2	40.6	58.1	40.5	46.6	46.5	Clear.	“	“					
49.2	3.0	14.8	8.0	0.230	0.203	0.269	79.6	39.8	58.0	40.0	44.3	42.0								
55.	3.5	15.	5.5	0.299	0.366	0.363	77.0	40.8	68.9	44.9	50.4	50.2	Clear.	Clear.	Clear.	N. 1.	N. 1.	0.	Min. 46°5.	
57.5	3.5	12.5	6	.379	.378	.395	78.6	46.6	67.4	51.3	51.2	52.4	“	“	“	“	“	50°		
49.	7.5	16.	9	.291	.302	.256	59.3	37.3	53.0	44.3	45.2	40.5	“	“	“	N. 1.			54°	
54.	2.5	14.5	7.	.280	.305	.334	82.2	40.3	62.2	43.3	45.5	47.9	“	“	“				45°	
53.5	1.0	13.	11.5	.341	.352	.288	92.7	44.8	46.6	48.4	49.2	44.0	“	“	“				45°	
55.5	3.5	14.	11.	.259	.389	.317	75.9	43.4	48.9	41.2	52.1	46.6	“	“	“	N. 1.	N. 2.		45°5.	
51.5	9.0	16.	11.5	.284	.302	.265	53.9	37.3	46.0	43.6	45.2	41.7	“	“	“	N. 2.	N. 3.			
51.5	5.	18.5	8.5	.245	.311	.288	67.8	33.1	55.7	39.7	46.1	44.0	Cir. 5.	Cir. 5.	Cir. 5.					
51.	3.5	16.	6.5	.305	.308	.300	76.6	37.4	63.4	45.4	45.7	45.1	Cir. cu. 8.	Cir. cu. 2.	0.				48°	
56.	4.5	20.	6.	.249	.289	.372	70.4	30.2	67.1	40.2	44.1	50.8	Cir. 2.	Clear.	“				48°	
54.	2.5	18.	6.	.298	.343	.344	82.6	34.6	66.4	44.8	48.6	48.7	Clear.	“	“	N. 1.			48°	
51.5	6.5	18.	7.5	.242	.302	.302	61.2	33.7	61.4	39.4	45.2	45.2	Hazy.	Cir. 4.	Cir. 8.					
60.5	3.	21.	5.5	.317	.350	.449	80.0	30.0	40.4	46.4	49.1	56.0	Clear.	Clear.	Clear.				51°. Max. 86°	
57.	5.	25.	18.	.406	.383	.289	71.8	25.5	33.4	53.2	51.6	44.0	“	Cir. cu. 8.	Cir. cu. 10.	Cir. cu. 7.	S. 1.	S. 2.	S. 2.	
54.5	11.	16.5	8.	.400	.346	.321	50.9	37.4	58.5	52.7	48.9	47.6	Cir. cu. 8.	Cir. cu. 10.	Cir. cu. 7.	S. 1.	N. 5.	N. 5.		
45.5	5.5	13.	7.5	.291	.284	.229	67.2	42.0	56.9	44.2	40.7	48.0	Cir. cu. 8.	Clear.	Clear.	N. 6.	N. 6.	N. 6.		
51.	6.	13.	5.5	.207	.260	.310	61.8	42.2	67.8	35.4	41.3	45.9	Clear.	Cir. cu. 3.	“	N. 2.	N. 4.	N. 3.		
43.	4.	13.5	6.	.197	.235	.216	71.1	40.1	62.2	34.2	38.7	36.5	“	Clear.	“	N. 4.			39°5.	
44.5	1.5	12.	5.5	.226	.215	.231	87.9	42.9	62.8	37.6	36.3	38.2	“	Cu. st. 5.	“	N. 5.	N. 6.	N. 6.		
46.5	4.5	11.5	7.5	.244	.232	.239	70.2	44.9	57.4	39.6	38.4	39.1	Cu. 5.	Cu. 5.	“	N. 6.	N. 5.	N. 5.		
45.	0.5	12.	6	.282	.267	.236	96.1	44.8	63.1	43.4	42.0	38.8	Clear.	Clear.	“	N. 3.	N. 4.	N. 1.		
52.5	1.	11.	7.5	.276	.325	.309	92.2	49.1	59.8	42.8	47.2	45.9	“	“	“	N. 0.	N. 3.	N. 4.	37°5.	
52.	1.5	12.5	6.	.334	.327	.318	89.4	45.2	65.3	47.9	47.3	46.6	“	“	“	N. 4.	N. 3.	N. 3.		
52.	2.	13.5	7.	.304	.312	.308	85.7	42.6	61.6	45.3	46.1	45.8	“	“	“				45°	
54.5	2.	12.	4.5	.286	.324	.367	85.3	46.5	73.5	43.8	47.0	50.5	“	Cir. 7.	“				43°	
48.5	1.	15.5	5.	.354	.299	.284	92.8	38.2	69.1	49.5	44.9	43.5	“	Cir. 4.	“				45°	
53.	1.	13.	5.	.304	.316	.341	92.3	43.9	70.7	45.4	46.4	48.5	“	Cir. 2.	“					
52.	1.5	16.5	6.	.367	.311	.318	89.8	36.6	65.8	50.5	46.0	46.6	Clear.	“	“				46°5.	
51.9	3.7	15.1	7.4	0.295	0.311	0.307	77.2	39.7	60.9	44.2	45.7	45.3								